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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/676,330

09/30/2003

A. Daniel Feller

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06/14/2007

INTEL CORPORATION

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EXAMINER

GEORGE, PATRICIA ANN

ART UNIT

PAPER NUMBER

1765

MAIL DATE

DELIVERY MODE

06/14/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/676,330

Applicant(s)

FELLER ET AL.

Examiner

Patricia A. George

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 May 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6,8 and 10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6,8 and 10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 5/21/07.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☒ Other: Bib.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 5/21/2007 has been entered.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-6, 8 and 10 rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Applicants recite use of "ethoxylate ether", however an ethoxylate would either be an - - - ethoxylate ester - - -, or an - - - ethoxide ether - - -. Examiner fail to understand how an ether can be an oxylate. As to claim 10, glucolic acid and ethoxylate, are claimed to be from a group of ethoxylate ethers. Examiner understand

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an ethoxylate can be an ester, and glucolic acid could be use to make an ether, however examiner fail to comprehend how either chemical is an ether.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 1-6, 8 and 10 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicants recite "ethoxylate ether", however an ethoxylate would either be an - - - ethoxylate ester - - -, or an - - - ethoxide ether - - -.

Claim 10 also rejected for similar chemistry error. Glucolic acid and ethoxylate, are to claimed as further limitations of ethoxylate ether, of claim 1, however neither chemical is an ether.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was

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made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-6, 8, and 10 are rejected under 35 U.S.C. 103 as being unpatentable over Wang et al. (6,362,104) in view of Kato et al. (6,340,374), and Minami Fukugaku (JP 2000-352443; pub 5/2002) evidenced by Sigma Aldrich Fine Chemicals (Engineering Polymers (cont.); Surfactants; 5/2003; <http://web.archive.org/web/20030509223455/http://www.sigmaaldrich.com/img/assets/3900/Surfactants.pdf>).

Wang teaches slurry comprising: abrasives (as in claim 1) such as silica, or alumina (as in claim 8) (see col. 2, lines 23-37); pH of the slurry at 2-11, which encompasses applicants range of between about 4 to 8, as in claim 1 (see col. 10, lines 26-27); a corrosion inhibitor, such as BTA (as in claims 2 and 3) (see col. 8, line 47); a buffer system comprising an organic acid such as acetic, citric, or oxalic acid (as in claim 4 and 5) (see col. 8, lines 55-58), a salt of the organic acid such as potassium acetate (as in claim 4 and 6) (see col. 2, lines 23-37); and a surfactant (see col. 9, lines 40-44). Wang teaches periodic acid (see col.4, line 51) at a rate of 0.1 to 20 wt % (col.5, line 14) which appears to overlap the claimed units of a molar concentration from about 0.004M to about 0.006M, as in claim 1.

Although the reference of Wang does not explicitly disclose the concentration of periodic acid in the claimed units of molarities, it would have been obvious to one of ordinary skill in the art at the time of invention was made, to make the necessary conversion of weight percent, as Wang, when determining the molar amount of periodic

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acid, as in applicants' limitation, because all ingredients of the slurry would be known and calculative. Further, it would have been obvious to one of ordinary skill in the art at the time of invention was made, to adjust the quantity of periodic acid, for desired results, as applicants' limitation, when forming the slurry, as Wang, because the invention of Wang illustrates the concentration of periodic acid may be adjusted to achieve desired results, evidenced by the range of Wang.

Although Wang teaches applicants' preferred range of abrasive (see applicant specification para 15) and rejection above, Wang does not teach applicants' amended range of 26 to 30 percent abrasives.

Kato teaches slurries may have from 1 to 40% by weight silica and cerium oxide abrasive particles (see abstract).

It would have been obvious to one of ordinary skill in the art at the time of invention was made, to modify the CMP slurry with abrasives, as Wang, to include the range of 1 to 40%, as Kato, because Kato teaches the grains increase the polishing rate, and the polishing rate is related to the device productivity therefor it is a highly desirable change (see background).

Although, the modified invention of Wang teaches use of surfactants, the invention of Wang fails to teach applicants' specifically claimed surfactants, as in claims 1 and 10.

Fukugaku et al. teaches use of anionic surfactants such as organic compound Perfluoro-alkyl BEDAIN, a perfluoro-alkyl ethylene oxide addition product, Perfluoro-

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alkyl oligomer, perfluoro-alkyl carboxylate, Perfluoro-alkyl quarternary ammonium salt (see para. 0009), which includes applicants' claimed chemistry for a surfactant, are used to solve problems encountered by RIE (see Problems to be solved...). Sigma Aldrich Fine Chemicals (Engineering Polymers (cont.) provides further evidence that applicants' specifically claimed surfactants are shelf ready, and known stabilizers for micro-emulsions, see attachment.

It would have been obvious to one of ordinary skill in the art at the time of invention was made, to modify the invention of CMP slurry, as Wang, to include applicants' specifically claimed surfactants, because Fukugaku et al . teaches they provide enhanced processing to RIE, and Sigma Aldrich Fine Chemicals provides shelf ready specifically claimed surfactants, which are known to stabilize such micro-emulsions.

Response to Arguments

Examiner agrees with applicants' remarks, on pages 4-5, that the newly amended limitation, ethoxylate ether, was not considered in prior office actions. Please see new ground for rejections, above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patricia A. George whose telephone number is (571)

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272-5955. The examiner can normally be reached on Tues. - Sat. between 8:00 am and 4:00 pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


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06/07

Patricia A George
Examiner
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DUY-VU N. DEO
PRIMARY EXAMINER


6/11/07